Jordanopsyllini, n. tribe

Clypeal tubercle absent. Integrecipitate. Maxillary lobe reduced. Labial palpus elongate, extending beyond trochanter. Bristles on procoxa reduced in number; mesocoxa and metacoxa with a full vertical row of mesal bristles. Mesonotum subequal to metanotum in breadth. Lateral metanotal area prominent, well demarcated. Metepisternum with anterior and dorsal margins convex, not reduced. Typical spiracles subcylindrical. Metepimere not fused with metanotum. With a striarium on basal sternum. One antepygidial bristle in female.

ACKNOWLEDGEMENTS

Dr. Karl Jordan, of the British Museum, Tring, kindly verified the tribal and generic status of this flea. We are indebted also to Miss Phyllis Johnson, Army Medical Service Graduate School, Washington, D. C., for critical review of the manuscript.

LIST OF ABBREVIATIONS

A.B. Antepygidial bristle
A.S. Anal stylet
B.C. Bursa copulatrix
L.P. Labial palpus
L.M. Lateral metanotal area
MX. Maxillary lobe
M.P. Maxillary palpus
MPM. Mesepimere
MPS. Mesepisternum
MSN. Mesonotum
MTN. Metanotum
MTM. Metepimere
MTS. Metepisternum
PL.A. Pleural arch of metathorax
SP. Spermatheca
SPC. Spiracle
TR. Trochanter
V.A.L. Ventral anal lobe of proctiger
7*S.* Seventh sternum
1*T.* First tergum
8*T.* Eighth tergum

LITERATURE CITED

HOLLAND, G. P. *The Siphonaptera of Canada.* Canada Dept. Agr. Techn. Bull. 70 (Publ. 817). Ottawa, 1949.

TRAUB, ROBERT. *Siphonaptera from Central America and Mexico: A morphological study of the aedeagus, with descriptions of new genera and species.* Zool. Mem. Chicago Nat. Hist. Mus. **1** (1): 1–127, 54 pls. 1950.

———. *Records and descriptions of fleas from Peru (Siphonaptera).* Proc. Ent. Soc. Washington [in press].

ZOOLOGY.—*A luminescent new xystodesmid milliped from California.* H. F. LOOMIS, Coconut Grove, Fla., and DEMOREST DAVENPORT, University of California, Santa Barbara College, Santa Barbara, Calif.

A luminescent milliped has been discovered in central California. While luminescent chilopods have been reported, the question of self-luminous diplopods is still uncertain. There are several references in entomological literature to luminescent creatures that may or may not have belonged to this group or that may have been infected with luminous bacteria.

In 1949 a field party of plant ecologists in the mountains of Tulare County, Calif., first observed this handsome species at night near their camp and gathered living specimens, which were turned over to the junior author, who made various observations on them and sent preserved specimens to the senior author.[1] Unfortunately, all specimens were females and impossible to identify beyond placement in the family Xystodesmidae, but a collection made a year later for the purpose of gathering males was successful. Taxonomic study of these specimens shows they unquestionably represent an undescribed species and genus with several outstanding structural peculiarities in addition to the phenominal one of being the first authenticated luminescent milliped.

Luminodesmus, n. gen.

Gentotype.—Luminodesmus sequoiae, n. sp.

Diagnosis.—Obviously related to the genus *Motyxia* Chamberlin but with more complicated gonopods, there being a fourth ramus, whereas *Motyxia* has but three; the dorsal tuberculation shows the greatest development of any known xystodesmid. A tendency to tuberculation has been observed in a few of the other species but the majority of them lack this form of sculpture.

Description.—Body of average size for the family or larger; both sexes strongly convex above. Segments 2, 3, and 4 with lateral carinae

[1] Our thanks are due Dr. E. N. Harvey, Princeton University, Princeton, N. J., for being instrumental in bringing about the collaboration on the present paper.

directed forward, those of segments 5 to 15 projecting outward, while on segments 16 to 19 they are caudally produced; posterior corners of all segments rounded except those of segment 19, which has them reduced in size but bluntly acute. On segment 1 a few scattered raised pustules usually are evident, but they are more evident and numerous on the succeeding segments, and from segment 9 or 10 backward distinct scattered pustules are present on the sides of the dorsum and in a continuous series close to the posterior margin, on segments 17 to 19 there being 14 to 20 tubercules in this series. First joint of legs produced distally below into a short, blunt, conic lobe; second joint with a distal, slender, very acute, spinelike lobe half as long as the joint. Males with a pair of high conic sternal processes between the fourth legs, these lacking in the female, but on the sterna of both sexes thereafter a process is present adjacent to each coxa, the posterior pair of each sternum being most prominent especially on the posterior segments. Gonopods with long basal joint, the outer half of the terminal joint composed of four very dissimilar divisions or branches. Claws on anterior legs of the males not differing from those of the female, being neither enlarged nor abruptly curved beyond middle.

Luminodesmus sequoiae, n. sp.

Two males, one the type, and several females collected May 12–14, 1950, at campground directly above Camp Nelson at the juncture of Belknap Creek and the south fork of the middle fork of Tule River, Sequoia National Forest, Tulare County, Calif., at an altitude of approximately 5,000 feet. Paratype females from same locality collected in mid-May 1949. The species was found at the lower limits of the Sequoia zone, where these giant trees were associated with *Pinus*, *Libocedrus*, *Quercus*, and *Acer*. The hardwood lower story of this association provided a relatively moist leafy litter in which many of the animals were collected.

Male type and paratype females deposited in the U. S. National Museum. Male and female paratypes deposited in the University of California, Berkeley, and female paratypes in the California Academy of Sciences, San Francisco.

Description.—Width of the largest specimen, a female, 7.5 mm; the living color light pinkish tan, more pronounced on lateral carinae, a dark internal structure showing through the body-wall down the center of the dorsum. Opening through which the gonopods project transversely lenticular-triangular in shape, the posterior margin broadly and evenly rounded from side to side and thinly elevated high above the adjacent surface; anterior margin on each side oblique, meeting at a distinct angle at the midline of the body, the margin flat, not elevated above the adjacent surface. Gonopod as shown in the accompanying figure except that none of the basal hairs have been drawn.

Remarks.—This interesting species may occur in great numbers; it was possible to collect dozens of animals in the immediate vicinity of the campground at the type locality where, at night, they provided a striking display of luminescence. The appendages of the head, the legs, the margins of the terga, and the thin intersegmental junctures gave a pale greenish fire, the undulations of which were particularly striking when the animal was in motion. The source of the luminescence has not as yet been determined. The light is under no voluntary control on the part of the animal; it persists in daylight (subjection to darkness is not necessary for its appearance), and its source is fluorescent, as subjection of animals during daylight to ultraviolet light has demonstrated.

The function of luminescence in most creatures is to attract either the opposite sex or food. Since it appears that neither of these objectives can apply to this milliped, the members of its order being blind and all diplopods subsisting only on vegetable matter, the part luminescence plays in the life history of this species is problematical.

Fig. 1.—*Luminodesmus sequoiae*, n. gen. and sp.: Distal joint of left gonopod.

In the winter of 1932, W. B. Murbarger, of Kaweah, Calif., (in Tulare County about 30 miles north of Camp Nelson), sent specimens of a xystodesmid milliped to the Smithsonian Institution for identification, with the note that the animals were luminescent. Dr. O. F. Cook examined them and found all to be immature, impossible to identify, and requested additional specimens of Mr. Murbarger. These were sent, with a letter, on March 31, 1932, but apparently they also were young, for Dr. Cook, who was greatly interested in identifying the first known luminescent milliped and discussed it with the senior author, made no notes or comments on them, and no further attempts seem to have been made to secure adults.

Following identification of the foregoing Camp Nelson species, it now seems quite likely that Murbarger's specimens were *L. sequoiae*, and extracts from his two letters are of special interest. In his letter of February 24, 1932, he states that "these worms were taken beneath an oak tree and apparently were under no other trees in this locality (Kaweah, Tulare County, Calif.) Elev. about 3,000 feet. Their one peculiarity is that at night they are luminous and visible for some distance." When Dr. Cook requested additional specimens he mentioned that the emission of light by the animals might be limited to a particular season, but in replying on March 31, Murbarger wrote: "As to their emission of light being confined to certain seasons, I cannot say. I first noticed them the past December. At no time since then have they failed to be luminous in the dark. During the daytime they can only be found under moist boards, logs and the like but at night they seem to roam about in the leaves, under trees and like retreats. Regarding the color of living specimens, I have sketched the accompanying crude diagram. Younger ones are of a whiter, more transparent color, no yellow being present, but in all sizes and ages the dark line down the back is noticeable." In his very creditable sketch the first segment is indicated as being buff colored and the "back gray-yellow, shading to bright yellow on the serrated edge." If Murbarger's specimens actually were *L. sequoiae*, it appears that this species remains luminescent from December to mid-May at least.

ZOOLOGY.—*A new crayfish of the genus* Procambarus *from Louisiana, with a key to the species of the* Spiculifer *group.* Horton H. Hobbs, Jr., Miller School of Biology, University of Virginia. (Communicated by Fenner A. Chace, Jr.)

Three species of the *Spiculifer* Group (Hobbs, 1942:119) of the genus *Procambarus* have been described from the southern United States, and their combined ranges extend from eastern Louisiana to the Altamaha River drainage in Georgia; of the three, *P. spiculifer* (LeConte, 1856:401) has the largest range, having been reported from Mississippi, Alabama, Georgia, and northern Florida; *P. versutus* (Hagen, 1870:51) from Mississippi, Alabama, and Florida; *P. vioscai* Penn (1946:27) from Louisiana and Mississippi.

The species belonging to the *Spiculifer* group may be readily distinguished from the other members of the genus by possessing the combination of an areola less than 28 per cent of the entire length of the carapace, and two lateral spines on each side of carapace immediately caudad of the cervical groove.

Members of this group are all inhabitants of streams and are more abundant in those having a moderate current. Although there are few data available to indicate what factors in the environment limit their distribution to lotic situations, there is evidence that it is their inability to live in waters in which oxygen content is low. All these species have a broad areola (thus presumably a proportionally smaller gill chamber than do those species having a narrow one), and in American crayfishes, exclusive of the members of the genus *Cambarellus*, this feature is correlated with a lotic habitat. There is no evidence to suggest that the limiting factors in their ecological distribution are concerned with type of bottom, size of stream, pH, or hardness of the water, for both *spiculifer* and *versutus* have been taken from widely different types of streams.

The first specimens I saw of the species described below were collected by Percy Viosca from Talisheek, St. Tammany Parish, La., and have been deposited in the United States National Museum. Additional speci-